

Applicant: Markku Kyytsonen
Application No.: 10/516,572
Response to Office action mailed Mar. 9, 2007
Response filed July 9, 2007

In the Specification

Please amend the Abstract as follows:

A multi-roll calender (1) has one or several sets of rolls (2) attached to a frame (7) so that each set of rolls has at least three rolls. At least the first roll (3; 31) and the last roll (3; 32) have casings which can be moved toward the intermediate rolls (4). The first roll (3; 31) and the last roll (3; 32) are fixedly attached, at least one of the intermediate rolls (4) in the set of rolls is fixedly attached, and the other intermediate rolls are provided with lightening elements for lightening the auxiliary means related to the intermediate rolls. The roll nips (N) in the set of rolls (2) are closed by moving the first roll towards the intermediate rolls (4), and the roll nips between the last roll and the fixed intermediate roll included, are closed by moving the last roll towards the intermediate rolls (4).

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Please amend ¶ [0024] as follows:

[0024] Between the uppermost and the lowermost rolls there are five intermediate rolls 4, of which the middlemost intermediate roll 4; 43 is likewise attached directly to the calender frame 7 in a similar way as the uppermost and the lowermost rolls. The outermost intermediate rolls, i.e. the first intermediate roll 4; 41 and the fifth intermediate roll 4; 45, seen from the first, i.e. the uppermost roll 3; 31 of the set of rolls, are heated chill rolls. The [[said]] outermost intermediate rolls 4; 41, 45 are hard-surfaced rolls, which are rotatably pivoted to the bearing houses 41a, 45a from their ends. The intermediate rolls between the outermost intermediate rolls 41, 45 and the fixedly attached intermediate roll 43, i.e. the second intermediate roll 4; 42 and the fourth intermediate roll 4; 44 are flexible-surfaced polymer-coated rolls. The middlemost intermediate roll is fixedly attached to the calender frame in a similar way as the uppermost and the lowermost roll. The middlemost intermediate roll is a smooth-surfaced metal roll.

Please amend ¶ [0027] as follows:

[0027] Figure 2 presents the development of the linear load distribution of the roll nips N in the set of rolls 2 as loads are directed to the intermediate rolls 4 on the lower roll 3; 32. For facilitating the observation it is assumed that the own gravity of the intermediate rolls and the load caused by the auxiliary means related to the intermediate rolls 4; 4; 41, 42, 43 and 44 is completely lightened. The set of rolls 2 is similar to the one shown in Figure 1 so that the intermediate roll 43 is fixedly attached to the calender frame. In [[the]] Figure 2 it is shown how the additional load F1 brought to the lowermost roll causes the linear load F2 in the roll nip N; Nc2 facing the lowermost roll of the fixedly attached intermediate roll, and the additional load F3 in the roll nip N;

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Nc1 on the other side of the intermediate roll. The additional load F1 and the loads F2 and F3 are marked approximately to the middle point of the lower roll and the roll nips as resultant forces; in fact, the load forces in question are distributed to the length of the whole lower roll and the roll nips Nc1 and Nc2. The linear load F2 achieved by the additional load F1 in the roll nip Nc2 between the fixed intermediate roll 32 and the intermediate roll 44 is considerably bigger than the linear load F3 in the roll nip Nc1 between the fixed intermediate roll 43 and the intermediate roll 42, due to the rigid fastening of the intermediate roll 4; 43. The additional load F1 could as well be brought to the upper roll 31, in which case the additional load would cause a linear load in the roll nip Nc1 between the fixedly attached intermediate roll 43 and the intermediate roll 42, respectively, which would be considerably bigger than the linear load in the roll nip Nc2 between the fixed intermediate roll 43 and the intermediate roll 44. The additional load can be brought to the lower/upper roll either by internal loading devices of the said upper and lower rolls 3; 31, 32, with which the deflections usually caused by the gravity of the said rolls are compensated or, alternatively, the load can be brought to the said rolls using an outside force, such as a roll 51 outside the set of rolls, with which, for example, the lower roll 32 would be pressed towards the intermediate rolls 4 in the direction of the set of rolls. The direction of the plane of the set of rolls is the same as the direction of the plane drawn through the central line of the rolls in the set of rolls.

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Please amend ¶ [0029] as follows:

[0029] The multi-roll calender shown in Figure 3A consists of two sets of rolls 2 attached to the same frame, with a so-called reverse nip between them. The sets of rolls are identical and for illustrating this, their parts are indicated by the same numbers. Both sets of rolls 2; 21 and 2; 22 consist of upper and lower rolls 31, 32 fixedly attached to the frame, and of three intermediate rolls 4, the middlemost 42 intermediate roll of which is fixedly attached to the frame. The outermost intermediate rolls 41 and 43 are polymer-coated elastic rolls, and the intermediate roll ~~[[43]]~~ 42 attached to the frame is a heated smooth-surfaced chill roll. The outermost intermediate rolls are suspended to the frame from their bearing houses by loading arms in a similar way as is shown in ~~the example~~ Figure 1 in connection of the intermediate rolls 41, 42, 44 and 45. The upper roll 31 and the lower roll 32 are heated smooth-surfaced chill rolls and they have internal loading devices for the ~~[[said]]~~ rolls. The structure of the loading devices is similar to the one shown in Example Figure 1, in which the structure of the upper and lower rolls is described. The path of the fibre web W in the roll nips is shown by arrows with closed ends; for simplifying the figure, the take-off rolls are not shown in the figure. The last roll 3; 32 of the first set of rolls 2; 21 and the first roll 3; 31 of the second set of rolls 2; 22 are smooth-surfaced chill rolls so that a so-called reverse nip is formed to the set of rolls in which case it is possible to control the profiling of both sides of the fibre web with the set of rolls.